

(For students admitted in 2024-25 under the 4-year degree)

Extended Major Program in Artificial Intelligence

Extended Major is an add-on element to enrich the existing majors. Students should declare their Extended Major upon admission to HKUST or via the Opt-in Arrangement after they have been admitted to HKUST for guaranteed enrollment in the Extended Major with a Major. Students who wish to withdraw from the Extended Major should apply before the last day of the add/drop period in the first regular term of their final year of study.

The Extended Major in Artificial Intelligence is available for combination with Science Majors (BSc programs in Data Science and Technology, Mathematics, Ocean Science and Technology, Physics), any Engineering Majors or Business Majors (BBA/BSc programs in Professional Accounting, Economics, Finance, Global Business, Information Systems, Marketing, Management, Operations Management, Economics and Finance, Quantitative Finance, and Risk Management and Business Intelligence). It is designed for students with fundamental knowledge in calculus (e.g. MATH 1014/MATH 1020/MATH 1024), statistics (ISOM 2500/MATH 2411) and programming (COMP 1021/COMP 1022P/ISOM 3230), but also open to other students, given that they may be required to take one or two additional courses to acquire relevant foundation.

To graduate with an Extended Major, students must have enrolled in the Extended Major, complete a minimum of 22 credits and all of its requirements, as well as the requirements of the major program of study; and have attained an average grade point of at least 2.15 in courses taken within the Extended Major. All courses counted towards the Extended Major Requirements, as well as those used to fulfill the Major Requirements, will be included in the calculation of the Major Cumulative Grade Average (MCGA).

Students must take all the Extended Major requirement, within which they must complete at least 12 single-counted credits. These 12 credits cannot be used to fulfill any other requirements for graduation except for the 120-credit degree requirement. For credit transfer, students can transfer a maximum total of 6 credits to the Extended Major program.

Under the new 30-credit Common Core Program which is applicable to students admitted to the University in 2022-23 and thereafter, courses that have been counted towards School and/or Major Requirements are not allowed to be reused for fulfillment of the University Common Core Requirements. Students should look up the details of the Common Core Program including the general and School-/program-specific distributional requirements posted on the Common Core website where the link to it is available on this website.

Extended Major Requirements

Required Course(s)

			Credit(s) attained
EMIA	2010A	Cross-disciplinary Seminar: Artificial Intelligence	0
EMIA	2020	Cross-disciplinary Design Thinking	3
EMIA/COMP/ MATH		Note: EMIA 4110 <u>OR</u> COMP 4211 <u>OR</u> MATH 4432	3
EMIA	4110	Practical Machine Learning	3
COMP	4211	Machine Learning	3
MATH	4432	Statistical Machine Learning	3
EMIA		Note: EMIA 4990 <u>OR</u> EMIA 4991	0-3
EMIA	4990	Interdisciplinary Capstone Design	0
EMIA	4991	Interdisciplinary Capstone Project	3

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COMP		Note: COMP 2011 <u>OR</u> COMP 2012 <u>OR</u> COMP 2012H	4-5
COMP	2011	Programming with C++	4
COMP	2012	Object-Oriented Programming and Data Structures	4
COMP	2012H	Honors Object-Oriented Programming and Data Structures	5
COMP		Note: COMP 2211 <u>OR</u> COMP 3211	3
COMP	2211	Exploring Artificial Intelligence	3
COMP	3211	Fundamentals of Artificial Intelligence	3

Elective(s)

AIS/SSCI/ SENG/SBM/ SHSS			Minimum credit(s) required
		Artificial Intelligence Electives (Courses from the specified elective list. Students may use at most one course from the same course groups of COMP 4421/ELEC 4130/MATH 4336 and COMP 4462/DASC 3240 to count towards this elective requirement.) [Students taking EMIA 4990 should take a minimum of 9 credits. Students taking EMIA 4991 should take a minimum of 6 credits.]	6-9
CTDL	1902	AI and Society: Ethics, Cognition, and Critical Analysis	3
EMIA	3500A	AI and Design in Sci-Fi	2
EMIA	4500A	Exploring Design Thinking and AI in Smart City Development	3
IDPO	2500B	AI Literacy & Critical Thinking: Survival Skills for a Changing World	3
ISDN	3150	AI for Design	3
ISDN	4000S	Applied Generative AI for Interdisciplinary Projects	3
ACCT	4720	Equity Investment with Machine Learning	3
BIEN	3300	Data Science for Molecular Engineering	3
BIEN	3310	Data Science for Neural Engineering	3
BIEN	3320	Data Science for Biology and Medicine	3
CENG	3300	Data Science for Molecular Engineering	3
CIVL	4210	Advanced Construction with AI and Robotics	3
CIVL	4220	Scientific Machine Learning for Infrastructure Systems	3
CIVL	4360	Implementing Artificial Intelligence in Smart Buildings	3
COMP	1944	Artificial Intelligence Ethics	3
COMP	4221	Introduction to Natural Language Processing	3
COMP	4222	Machine Learning with Structured Data	3
COMP	4321	Search Engines for Web and Enterprise Data	3
COMP	4331	Data Mining	3
COMP	4332	Big Data Mining and Management	3
COMP	4421	Image Processing	3
COMP	4441	Music Video Creation	3
COMP	4451	Game Programming	3
COMP	4461	Human-Computer Interaction	3
COMP	4462	Data Visualization	3
COMP	4471	Deep Learning in Computer Vision	3
COMP	4531	IoT and Smart Sensing	3

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COMP	4641	Social Information Network Analysis and Engineering	3
COMP	4651	Cloud Computing and Big Data Systems	3
COMP	4901K	Machine Learning for Natural Language Processing	3
COMP	4901L	Foundations of Computer Vision	3
COMP	4901Y	Large-Scale Machine Learning for Foundation Models	3
COMP	4901Z	Reinforcement Learning	3
COMP	5211	Advanced Artificial Intelligence	3
COMP	5212	Machine Learning	3
COMP	5213	Introduction to Bayesian Networks	3
COMP	5214	Advanced Deep Learning Architectures	3
COMP	5221	Natural Language Processing	3
COMP	5223	Perception and Information Processing for Robotics	3
COMP	5331	Knowledge Discovery in Databases	3
COMP	5421	Computer Vision	3
DASC	3240	Data Visualization in Science	3
DASC	3250	Numerical Methods for Data Analytics in Science	3
DASC	4010	Practical Artificial Intelligence in Science	3
DASC	4400	Data Analytics in Information Science	3
ELEC	3130	Digital Image Processing	3
ELEC	3350	Principles of Machine Learning	3
ELEC	3810	Data Science for Neural Engineering	3
ELEC	4230**	Deep Learning for Natural Language Processing	3
ELEC	4240	Deep Learning in Computer Vision	3
ELEC	4350	AI Processor Architecture	3
HUMA	1930	Introduction to the Ethics of Artificial Intelligence and Data Science	3
IEDA	3010	Prescriptive Analytics	3
IEDA	3560	Predictive Analytics	3
ISOM	3340	Developing AI Applications	1
ISOM	3360	Data Mining for Business Analytics	3
ISOM	3390	Business Programming in R	3
LIFS	4320	Data Science for Biology and Medicine	3
MATH	3425	Stochastic Modeling	3
MATH	4335	Introduction to Optimization	3
MATH	4336	Introduction to Mathematics of Image Processing	3
MECH	3510	Computer-Aided Design and Manufacturing	3
MECH	4000P	AI in Mechanical Engineering	3
PHYS	4058	Information Physics	3
PHYS	4811	Contemporary Applications of Physics: Machine Learning in Physics	1
TEMG	4950N	T&M Corporate Consulting Project: Meta LLM for Digital Transformation of Viu International	4

****Remarks on course(s):**

- ELEC 4230: The course was last offered in 2020-21 and was deleted subsequently.